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CONTACT POINT

Anaphylactic reaction caused by skin contact with the disinfectant chloramine-T

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Chloramine-T (CAS no. 7080-50-4, syn. sodium *p*-toluenesulfonchloramide) is a crystalline powder with a chlorine basis, and is commonly used as a sterilizer, antiseptic, disinfectant, and chemical reagent. Sensitization is often work-related. We report a case of an anaphylactic reaction to chloramine-T.

CASE REPORT

A 32-year-old healthy non-atopic female with no history of asthma showed generalized itchy erythema, dyspnoea and vertigo 15 minutes after cooling a second-degree burn on her left underarm in water with added chloramine-T (Halamid). She was diagnosed with anaphylaxis, and observed and treated with 0.5 mg of intramuscular adrenaline and 2 mg of intravenous clemastine at the hospital. Some hours later, she was discharged, with only diffuse mild erythema remaining. She had performed cleaning activities at a butchery for 17 years without using gloves. She had regularly developed localized wheals after skin contact with chloramine-T. We performed prick tests with an in-house preparation of 10 mg/mL of the patient's product. Readings were performed after 15 minutes. Physiological salt as a negative control caused no wheal or flare. Histamine, as a positive control, and chloramine-T caused erythematous wheals and flares with mean diameters of 6 and 12.5 mm, respectively (Figure 1). Prick tests performed in three controls gave negative results. Laboratory tests showed a chloramine-T-specific IgE level of >100 kUA/L (values >0.34 kU/L were defined as positive) and a total IgE level of 870 kU/L (normal: 0-115 kU/L) (ImmunoCAP; ThermoFisher Scientific, Uppsala, Sweden).



FIGURE 1 Positive prick test (wheal and flare) reaction to chloramine-T after 15 minutes

DISCUSSION

This is the first report of an anaphylactic reaction caused by immediate-type hypersensitivity to chloramine-T. On review of the literature, we found several case reports describing urticaria, rhinitis and asthmatic bronchial obstruction caused by chloramine-T after skin contact or airborne exposure.^{1–8} Dooms-Goossens et al described a nurse with contact urticaria, dyspnoea and rhinitis after skin contact and airborne exposure to chloramine-T powder.⁵ Kujala et al reported a bath attendant with rhinitis and asthma after spraying the workplace with a chloramine-T solution.⁶ Kanerva et al described a hospital bath attendant with contact urticaria and rhinitis after disinfecting surfaces in hospital bath rooms with chloramine-T solution.⁷ Our patient was probably sensitized to chloramine-T during her cleaning activities in the last 17 years, producing chloramine-T-specific IgE antibodies. After binding of chloramine-T IgE antibodies to the mast cells and basophils, they become more sensitive for degranulation. When re-exposure to chloramine-T occurs, they degranulate (sooner). When chloramine-T binds to the IgE-loaded mast cells, it triggers the release of vasoactive substances such as histamine and tryptase. It is likely that our patient was exposed to a relatively large amount of chloramine-T through the burn wound, and that this triggered massive degranulation of mast cells, resulting in an anaphylactic reaction. After replacement of chloramine-T with chlorine at the workplace, the patient was free of symptoms.

CONFLICTS OF INTEREST

The authors have no conflicts of interest to report.

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